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Art Unit: 2654

Docket No.: 2000-0102

### **REMARKS**

Reconsideration and allowance in view of the foregoing amendments and the following remarks are respectfully requested.

By this amendment, claims 1-20 are pending, claims 9, 14 and 17 having been amended, and claims 18-20 having been added.

In the non-Final Office Action of November 18, 2004, the Examiner rejected claim 9 under 35 U.S.C. 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention; rejected claims 1-17 under 35 U.S.C. 102(a) as allegedly being anticipated by Singhal et al., "AT&T at TREC-7" in Proceedings of the Seventh Text Retrieval Conference (TREC-7), ed Voorhees et al., July 1999 ("Singhal"); and rejected claims 1 and 10 under 35 U.S.C. 102(b) as allegedly being anticipated by U.S. Patent No. 5,559,940 to Hutson.

#### **Rejection of Claim 9 under 35 U.S.C. 112, Second Paragraph**

On page 2 of the Office Action, the Examiner rejected claim 9 under 35 U.S.C. 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. In particular, the Examiner pointed out that the parameters shown in the equation of claim 9 need to be defined.

Applicants amended claim 9 to define the parameters in the equation. Therefore, Applicants submit that claim 9 is not indefinite and respectfully request that the rejection of claim 9 be withdrawn.

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**Rejection of Claims 1-17 As Allegedly Being Anticipated by Singhal**

On page 2 of the Office Action, the Examiner rejected claims 1-17 under 35 U.S.C. 102(a) as allegedly being anticipated by Singhal. Applicants respectfully traverse the rejection. Applicants amended claims 14 and 17 only to correct typographical errors and not for any reasons related to patentability. Further, Applicants submit that the amendment to claims 14 and 17 do not change the scope of the claim in any way.

Claim 1 is directed to a method of document expansion for a speech retrieval document by a recognizer. The method includes, among other things, truncating vectors by removing all terms in the vectors that are not recognized by the recognizer, thereby creating truncated vectors.

On page 3 of the Office Action, the Examiner asserted that Singhal, at page 244 and at section 3.3, discloses this feature. Applicants respectfully disagree.

Singhal, at page 244, discloses:

The one best transcript from a recognizer misses many content words and adds some spurious words to the spoken document. The misses reduce the *word-recall* (proportion of spoken words that are recognized) and the spurious words reduce the *word-precision* (proportion of recognized words that were spoken). We believe that information retrieval algorithms would benefit from a higher word recall and are robust against poor word precision. An approach to enhance word recall is to add new words that "could have been there" (words that were probably spoken but weren't the top choice of a speech recognizer) to the automatic transcriptions of a spoken document.

Several techniques are plausible for bringing new words into a document. An obvious one from an IR perspective is *document expansion* using similar documents: find some documents related to a given document, and add new words from the related documents to the document at hand. And from a speech recognition perspective, the obvious choice is to use word lattices which contain multiple recognition hypotheses for any utterance. A word lattice contains words that are acoustically similar to the recognized words could have been said instead of the words recognized in the one-best transcription.

We use both these techniques to do controlled document expansion for our second full SDR run att-s2. In our experiments we found that each method when used alone adds more spurious words to a document than is desirable. However, a controlled document expansion that incorporated information

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from both the sources helps in reducing the spurious words, allowing the good words to still be added to a document.

Thus, Singhal discloses that a technique of document expansion using similar documents and a technique of document expansion that uses word lattices from speech recognition, which contain multiple recognition hypotheses for any utterance, may be used to perform controlled document expansion. However, each method when used alone adds more spurious words to a document than one would want. A controlled document expansion that incorporates information from both methods helps in reducing the spurious words.

Applicants submit that the above method for performing controlled document expansion while suppressing spurious words that are caused by adding new words into a document is not the equivalent of truncating vectors by removing all terms in the vectors that are not recognized by the recognizer, as required by claim 1.

Singhal, at section 3.3, page 246, discloses:

We first discovered that constraining document expansion to allow only terms from the word-lattices generated by our recognizer held no additional benefit over not doing so. I.e. we can do document expansion only from NA news and the results were equally good or better.

Thus, Singhal discloses that limiting document expansion to permit only those terms from the speech recognizer's word lattice provided no benefit. Here, Singhal refers to limiting terms during document expansion, not truncating vectors by removing all terms in the vectors that are not recognized by the recognizer, as required by claim 1.

Because Singhal does not disclose each and every feature of claim 1, Applicants submit that claim 1 is not anticipated by Singhal and respectfully request that the rejection of claim 1 be withdrawn.

Claims 2-9 depend from claim 1 and are not anticipated by Singhal for at least the reasons discussed above with respect to claim 1. Therefore, Applicants respectfully request that the rejection of claims 2-9 be withdrawn.

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Claim 10 recites features similar to those of claim 1 and is not anticipated by Singhal for reasons similar to those discussed with respect to claim 1. Therefore, Applicants respectfully request that the rejection of claim 10 be withdrawn.

Claims 11-17 depend from claim 10 and are not anticipated by Singhal for at least the reasons discussed above with respect to claim 10. Applicants, therefore, respectfully request that the rejection of claims 11-17 be withdrawn.

**Rejection of Claims 1 and 10 As Allegedly Being Anticipated by Hutson**

On page 5 of the Office Action, the Examiner rejected claims 1 and 10 under 35 U.S.C. 102(b) as allegedly being anticipated by Hutson. Applicants respectfully traverse the rejection.

Claim 1 is directed to a method of document expansion for a speech retrieval document by a recognizer. The method includes, among other things, truncating vectors by removing all terms in the vectors that are not recognized by the recognizer, thereby creating truncated vectors.

On page 6 of the Office Action, the Examiner asserted that Hutson, at col. 2, lines 16-19, discloses the above-mentioned feature of claim 1. Applicants respectfully disagree.

Hutson, at col. 2, lines 13-22, discloses:

Textual data that is input to the multi-dimensional processing and display system of the present invention is from one or more documents that are reformatted and translated into numeric form and placed in one or more matrices. The matrices are modified to enhance and/or suppress certain words, phrases, subjects, etc. This multi-dimensional matrix form of textual data is then separated into a number of matrices of two-dimensional data which are concatenated together along a common dimension to form one large two-dimensional matrix.

Thus, Hutson discloses reformatting and translating textual data into numeric form and placing the numeric data into one or more matrices. The matrixes are modified such that certain words, phrases, subjects, etc. are enhanced or suppressed.

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Applicants submit that modifying matrices that include numeric data that was formatted and translated from textual data is not equivalent to truncating vectors by removing all terms in the vectors that are not recognized by the recognizer, as required by claim 1. Further, Hutson is completely silent regarding any disclosure or suggestion of removal of any terms in the vectors that are not recognized by a recognizer.

Because Hutson fails to disclose each and every feature of claim 1, Applicants submit that claim 1 is not anticipated by Hutson and respectfully requests that the rejection of claim 1 be withdrawn.

Claim 10 recites features similar to claim 1 and is therefore, not anticipated by Hutson, for at least reasons similar to those discussed with respect to claim 1. Therefore, Applicants respectfully request that the rejection of claim 10 be withdrawn.

#### **NEW CLAIMS 18-20**

Newly added claims 18-20 are directed to a machine-readable medium that includes, among other things, instructions for removing terms in the vectors that are not recognized by a speech recognizer, thereby creating truncated vectors. Applicants submit that the cited references do not disclose or suggest the above-mentioned features of claims 18-20.

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CONCLUSION

Having addressed all rejections, Applicants respectfully submit that the subject application is in condition for allowance and a Notice to that effect is earnestly solicited.

Respectfully submitted,

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